

Course Syllabus

Description: How do mathematicians think, write, and speak? Find out in Grade 6 Mathematics, where students will experience new ways of solving problems through interactive and engaging activities. With a focus on hands-on learning and real-world application, students will be exposed to foundational concepts needed for higher-level math study, including integer operations, equations, and statistics.

Instructional time for **Grade 6 Mathematics** will emphasize five areas:

1. performing all four operations with integers, positive decimals, and positive fractions with procedural fluency
2. exploring and applying concepts of ratios, rates, and percentages to solve problems
3. creating, interpreting, and using expressions and equations
4. extending geometric reasoning to plotting points on the coordinate plane, area, and volume of geometric figures
5. extending understanding of statistical thinking

Credits: 1

Estimated Completion Time: Two Segments / 32–36 weeks

Segment One

- Multiply and divide positive multi-digit numbers with decimals to the thousandths
- Solve multi-step, real-world problems involving any of the four operations with positive multi-digit decimals or positive fractions, including mixed numbers
- Compute products and quotients of positive fractions by positive fractions, including mixed numbers
- Rewrite positive rational numbers in different but equivalent forms, including fractions, terminating decimals, and percentages
- Define, plot, order, and compare rational numbers
- Represent and compare rational numbers that have opposite direction on a number line and explain the meaning of zero within a real-world context
- Find, interpret, and compare the absolute values of rational numbers as the distance from zero on a number line, given a mathematical or real-world context
- Define, plot, order, and compare rational numbers
- Evaluate positive rational numbers and integers with natural number exponents
- Rewrite the sum of two composite whole numbers having a common factor, as a common factor multiplied by the sum of two whole numbers
- Express composite whole numbers as a product of prime factors with natural number exponents
- Find the greatest common factor and least common multiple of two whole numbers given a mathematical or real-world context
- Add, subtract, multiply, and divide integers
- Translate written descriptions into algebraic expressions and translate algebraic expressions into written descriptions given a mathematical or real-world context
- Evaluate algebraic expressions using substitution and order of operations
- Apply the properties of operations to generate equivalent algebraic expressions with integer coefficients
- Determine which values make the equation or inequality true or false given an equation or inequality and a specified set of integer values
- Write and solve one-step equations in one variable using addition, subtraction, multiplication, and division within a mathematical or real-world context
- Translate a real-world written description into an algebraic inequality and represent the solution on a number line
- Add, subtract, multiply, and divide rational numbers (accelerated)
- Solve real-world problems involving any of the four operations with rational numbers (accelerated)
- Solve mathematical problems using multi-step order of operations with rational numbers including grouping symbols, whole-number exponents, and absolute value (accelerated)
- Apply properties of operations to add and subtract linear expressions with rational coefficients (accelerated)
- Determine whether two linear expressions are equivalent (accelerated)
- Write and solve one-step inequalities in one variable within a mathematical context and represent solutions algebraically or graphically (accelerated)

- Write and interpret ratios to show the relative sizes of two quantities given a real-world context
- Solve mathematical and real-world problems involving ratios, rates, and unit rates, including comparisons, mixtures, ratios of lengths and conversions within the same measurement system
- Determine a rate for a ratio of quantities with different units, and calculate and interpret the corresponding unit rate given a real-world context
- Generate or complete a two- or three-column table to display equivalent part-to-part ratios and part-to-part-to-whole ratios
- Apply ratio relationships to solve mathematical and real-world problems involving percentages using the relationship between two quantities
- Solve multi-step, real-world percent problems (accelerated)
- Apply ratios to solve real-world problems involving proportions (accelerated)
- Recognize and formulate a statistical question that would generate numerical data
- Find and interpret mean, median, mode, and range given a numerical data set within a real-world context
- Determine the minimum, the lower quartile, the median, the upper quartile, and the maximum given a box plot within a real-world context and use a summary of the data to describe the spread and distribution of the data
- Create box plots and histograms to represent sets of numerical data within real-world contexts
- Describe and interpret the spread and distribution of the data, including any symmetry, skewness, gaps, clusters, outliers, and the range given a histogram or line plot within a real-world context
- Determine and describe how changes in data values impact measures of center and variation given a real-world scenario
- Determine an appropriate measure of center or measure of variation to summarize numerical data, represented numerically or graphically, taking into consideration the context and any outliers (accelerated)
- Use the measure(s) of center and measure(s) of variability to make comparisons, interpret results, and draw conclusions about two populations given two numerical or graphical representations of data (accelerated)
- Use proportional relationships to make predictions about a population, given categorical data from a random sample (accelerated)
- Plot rational number ordered pairs in all four quadrants and on both axes and identify the x- or y-axis as the line of reflection when two ordered pairs have an opposite x- or y-coordinate
- Find distances between ordered pairs, limited to the same x-coordinate or the same y-coordinate, represented on the coordinate plane
- Solve mathematical and real-world problems by plotting points on a coordinate plane, including finding the perimeter or area of a rectangle
- Derive a formula for the area of a right triangle using a rectangle and apply the formula to find the area of a triangle
- Solve mathematical and real-world problems involving the area of quadrilaterals and composite figures by decomposing them into triangles or rectangles
- Apply formulas to find the areas of trapezoids, parallelograms, and rhombi (accelerated)
- Solve mathematical or real-world problems involving the area of polygons or composite figures by decomposing them into triangles or quadrilaterals (accelerated)
- Find the surface area of right rectangular prisms and right rectangular pyramids using the figure's net given a mathematical or real-world context
- Solve mathematical and real-world problems involving the volume of right rectangular prisms with positive rational number edge lengths
- Determine the sample space for a simple experiment (accelerated)
- Find the theoretical probability of an event related to a simple experiment (accelerated)
- Interpret the likelihood of a chance event occurring and compare the probabilities of chance events (accelerated)
- Find experimental probabilities and compare them to theoretical probabilities (accelerated)

Course Grading: Besides engaging students in challenging curriculum, the course guides students to reflect on their learning and evaluate their progress through a variety of assessments. Assessments can be in the form of practice lessons, multiple-choice questions, writing assignments, projects, research papers, oral assessments, and discussions. This course will use the state-approved grading scale. Each course contains a mandatory final exam or culminating project that will be weighted at 20% of the student's overall grade.

Course Assessment and Participation Requirements: To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, "any pace" still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice lessons, multiple choice questions, projects, discussion-based assessments, and discussions.

